

TITLE

DISPLAY APPARATUS AND CONTROLLING METHOD THEREOF

CLAIM OF PRIORITY

[0001] This application makes reference to, incorporates the same herein, and claims all benefits accruing under 35 U.S.C. §119 from my application *DISPLAY AND CONTROLLING METHOD THEREOF* filed with the Korean Industrial Property Office on 13 June 2001 and there duly assigned Serial No. 33187/2001.

BACKGROUND OF THE INVENTION

Technical Field

[0002] The present invention relates in general to a display apparatus and a controlling method thereof, and more particularly, to a display apparatus and a controlling method thereof, in which data indicated with a bar code can be displayed through on-screen display.

Related Art

[0003] A bar code is a combination of thick lines, fine lines and blank spaces, through which English letters, digits or special signs can be represented so as to be easily read by optical means, and thus data is represented, collected, and read through the bar code.

1 [0004] The bar code is comprised of blanks positioned at a leading and trailing ends of the bar
2 code, a start line indicating a data start point and the kind of the bar code, a stop line indicating a data
3 end point, and an interpretation line positioned at an upper or a lower part of the bar code and
4 represented by digits, English letters, and signs such as a hyphen. The bar code used in a field
5 requiring accurate data further comprises a check digit checking whether or not data is accurately
6 read.

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[0005] The bar code indicates data of goods on a manufacturing nation, a manufacturing company,
a manufacturing code number, a manufacturing standard, a price, and other information thereof. The
data may be changed according to the kind of goods, a manufacturing company, or the kind of the
bar code.

[0006] Generally, to a display apparatus is adhered a bar code indicating data on a manufacturing
company, a manufacturing date, a manufacturing model, and other information, and therefore a
manufacturer utilizes the bar code when the display apparatus is in inventory management or after-
sale service.

15 [0007] In the case of after-sale service, a service engineer repairs the display apparatus and records
16 data on the repair service, and then obtains contents of the bar code of the display apparatus by
17 reading the bar code with a bar-code reader. Thus, it is possible to make a database on the basis of

1 the service data together with the contents such as a manufacturing date, a manufacturing model, and
2 other information, of the bar code of the display apparatus, so that the data stored in the database
3 may be used for goods development data.

4 [0008] However, the bar code may be worn away or vanished due to carelessness of a user or
5 during movement of the display apparatus, so that it is difficult to get data on the display apparatus
6 through the bar code.

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[0009] Exemplars of recent efforts in the art include Korean Patent Publication No. 1994-5120 to Jin-Won Ahn, entitled *APPARATUS FOR DISPLAYING TV MANUFACTURER AND MODEL NAME*, published on March 16, 1994, Korean Patent Publication No. 1999-13188 to Jung-Nong Lee, entitled *TELEVISION SET DISPLAYING INFORMATION REPRESENTING USING TIME AND DATA OF THE TV SET*, published on February 25, 1999, Korean Patent Publication No. 1999-47166 to Kyung-Sam Park, entitled *APPARATUS AND METHOD OF AUTOMATICALLY ADJUSTING WHITE BALANCE IN A TV*, published on July 5, 1999, Korean Patent Publication No. 2000-40889 to Joong-Hyun Cho, entitled *SCREEN ADJUSTING APPARATUS IN A MONITOR USING A BAR CODE*, published on July 5, 2000, Korean Patent Publication No. 1997-123794 to Myung-Ui Song, entitled *SYSTEM AND METHOD OF AUTOMATICALLY ADJUSTING A TV SET*, published on September 19, 1997, Japanese Patent Publication No. 06-217222 to Hayashi, entitled *TELEVISION RECEIVER*, published on August 5, 1994, Japanese Patent Publication No. 08-116560

1 to Isokawa *et al.*, entitled *INSPECTION DEVICE*, published on May 7, 1996, Japanese Patent
2 Publication No. 08-223496 to Sasaki, entitled *SECRET PRODUCTION NUMBER DISPLAY*
3 *DEVICE*, published on August 30, 1996, and Japanese Patent Publication No. 08-023487 to Sasaki,
4 entitled *ROM NAME DISPLAY DEVICE*, published on January 23, 1996.

5 [0010] While these recent efforts provide advantages, I note that they fail to adequately provide
6 an efficient, convenient, and improved display apparatus and controlling method thereof.

SUMMARY OF THE INVENTION

7 [0011] Accordingly, the present invention has been made keeping in mind the above-described
8 shortcomings and user's need, and an object of the present invention is to provide a display apparatus
9 and a controlling method thereof, in which it is easy to get data implied with a bar code when the
10 bar code may be worn away or vanished.

11 [0012] This and other objects of the present invention may be accomplished by the provision of
12 a display apparatus comprising a display part displaying a video signal, comprising a memory
13 storing a predetermined bar code data; a bar code show key for selecting the bar code data stored in
14 the memory to be displayed; an on screen display (OSD) part executing an on screen display for
15 adjusting a displaying state of the display part; and a controller controlling the bar code data to be
16 displayed on the display part through the on screen display part when the bar code data is selected
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1 by the bar code show key.

2 [0013] Preferably, the bar code data is represented with a bar code. Preferably, the bar code data
3 includes manufacturing data on at least one of a manufacturing model, a manufacturing specification,
4 an accessories specification, and other information.

5 [0014] In the memory is further stored after-sale service data on at least one of service times, a
6 cause of service, a solution of the cause, and other information, and the controller displays on the
7 on screen display an after-sale service indicating line represented by at least one of digits, English
8 letters, and signs, and indicating the after-sale service data when the bar code data is selected by the
9 bar code show key.

10 [0015] The controller controls used fact data on at least one of used time and on/off times to be
11 stored in the memory, and the bar code indicates the used fact data.

12 [0016] According to another aspect of the present invention, the above and other objects may be
13 also achieved by the provision of a method of controlling a display apparatus comprising a display
14 part displaying a video signal, comprising the steps of storing a predetermined bar code data in a
15 memory; selecting the bar code data to be displayed; and displaying the bar code data stored in the
16 memory on the display part.

1 [0017] In the displaying step, on the display part is displayed manufacturing data on at least one
2 of a manufacturing model, a manufacturing specification, an accessories specification, and other
3 information, is displayed on the display part; an after-sale service data on at least one of service
4 times, a cause of service, a solution of the cause, and other information; or used fact data on at least
5 one of used time and on/off times to be stored in the memory.

6 [0018] To achieve these and other objects in accordance with the principles of the present
7 invention, as embodied and broadly described, the present invention provides a display apparatus
8 having a display part displaying a video signal, the apparatus comprising: a memory storing
9 predetermined bar code data; a bar code show key for selecting said bar code data to be displayed;
10 an on screen display part executing an on screen display adjusting a displaying state of said display
11 part; and a controller controlling said bar code data to be displayed on said display part through said
12 on screen display part when said bar code data is selected by said bar code show key.

13 [0019] To achieve these and other objects in accordance with the principles of the present
14 invention, as embodied and broadly described, the present invention provides a method of
15 controlling a display apparatus comprising a display part displaying a video signal, comprising:
16 storing predetermined bar code data in a memory; selecting said bar code data to be displayed; and
17 displaying said bar code data stored in said memory on said display part.

1 [0020] To achieve these and other objects in accordance with the principles of the present
2 invention, as embodied and broadly described, the present invention provides an apparatus,
3 comprising: a memory storing bar code data; a bar code show key for selecting said bar code data
4 to be displayed; an on screen display part activating an on screen display to adjust a display state of
5 said on screen display part; and a controller controlling said bar code data to be displayed on said
6 display part through said on screen display part when said bar code data is selected by said bar code
7 show key, said bar code data being displayed as a bar code on said on screen display part, said bar
8 code data including manufacturing data having information about at least one selected from among
9 a manufacturing model, a manufacturing specification, and an accessories specification.

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10 [0021] To achieve these and other objects in accordance with the principles of the present
11 invention, as embodied and broadly described, the present invention provides a method, comprising:
12 storing bar code data in a memory, said bar code data including predetermined manufacturing data
13 for an apparatus; selecting said bar code data to be displayed; and in response to said selecting,
14 displaying said bar code data on a video display conveying varying visual information.

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[0022] To achieve these and other objects in accordance with the principles of the present
invention, as embodied and broadly described, the present invention provides a computer storage
medium having stored thereon a set of instructions implementing a method, said set of instructions
comprising one or more instructions for: storing bar code data in a memory of an apparatus; selecting

1 said bar code data to be displayed; and in response to said selecting, displaying said bar code data
2 on a video display conveying varying visual information.

3 [0023] The present invention is more specifically described in the following paragraphs by
4 reference to the drawings attached only by way of example. Other advantages and features will
5 become apparent from the following description and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

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7 [0024] In the accompanying drawings, which are incorporated in and constitute a part of this
8 specification, embodiments of the invention are illustrated, which, together with a general
9 description of the invention given above, and the detailed description given below, serve to
10 exemplify the principles of this invention.

11 [0025] Fig. 1 is a front view of a display apparatus on which a bar code is displayed, in accordance
12 with the principles of the present invention; and

13 [0026] Fig. 2 is a control block diagram of the display apparatus in Fig. 1, in accordance with the
14 principles of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

15 [0027] While the present invention will be described more fully hereinafter with reference to the
16 accompanying drawings, in which a preferred embodiment of the present invention is shown, it is
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1 to be understood at the outset of the description which follows that persons of skill in the appropriate
2 arts may modify the invention here described while still achieving the favorable results of this
3 invention. Accordingly, the description which follows is to be understood as being a broad, teaching
4 disclosure directed to persons of skill in the appropriate arts, and not as limiting upon the present
5 invention.

6 [0028] A display apparatus according to the present invention can display bar code data on a panel
7 through on screen display (OSD). As shown in Fig. 1, the display apparatus is comprised of a main
8 body 1 forming an external appearance, a panel 3 on which a picture is displayed. At the lower part
9 of the main body 1 is provided a control part 15 generating a signal executing or activating an on
10 screen display on the panel 3 and a control signal setting up the panel 3 through the on screen
11 display.

12 [0029] The control part 15 comprises a menu key 31 executing the on screen display, an arrow
13 keys 33 moving a cursor in up, down, left, and right directions so as to select a menu, a close key
14 32 concluding the on screen display or moving a menu to a high menu.

15 [0030] As shown in Fig. 2, a control circuit of the display apparatus comprises a digitizing part
16 55 converting red/green/blue (R/G/B) analog and horizontal/vertical (H/V) synchronous signals
17 which are inputted from an input/output (I/O) connector 53 connected to a computer into digital
18 signals, a clock signal output part 54 provided in the digitizing part 55 and outputting a clock signal,

1 a controller 50 detecting a resolution, a timing mode and a dot clock by reading the frequencies of
2 the H/V synchronous signals outputted from the I/O connector 53, and controlling a clock signal
3 output part 54 to output a standard clock signal, a scaler 57 receiving the R/G/B signals digitized by
4 the digitizing part 55 and the clock signal outputted from the clock signal output part 54, and
5 changing the signals in size or processing the signals, and a panel driver 59 formatting the signals
6 from the scaler 57 to be displayed on the panel 3.

7 [0031] Further, the control circuit of the display apparatus further comprises an on screen display
8 part 61 showing an on screen display according to a control of the controller 50, a memory 60 storing
9 an extended display identification data (EDID), bar code data, used fact data, and after-sale service
10 data, and a bar code show key 13 for selecting the bar code and an after-sale service indicating line
11 25 to be shown. The memory 60 can be an electrically erasable programmable read only memory
12 (EEPROM).

13 [0032] The bar code show key 13, as shown in Fig. 1, may be separately provided, or the control
14 part 15 may be employed instead of the bar code show key 13 by combination of the keys thereof.

15 [0033] Herein, the extended display identification data, one of the data stored in the memory 60,
16 includes data on a manufacturing company, a manufacturing data, a manufacturer's adjustment, a
17 user mode, and other information. The bar code data includes data on accessories such as a
18 microcomputer, a scaler chip, an analog-to-digital conversion (ADC) chip, and other information

1 together with data on a manufacturing model and a manufacturing specification, which are indicated
2 through the bar code. The used fact data includes used facts for the display apparatus such as used
3 time, a power on/off times, and other information, and is recorded in the bar code together with the
4 bar code data. The after-sale service data includes data on service times, a cause of service, a
5 solution of the cause, a name of service engineer, and other information, and the after-sale service
6 indicating line 25, like an interpretation line 22 of the bar code, is represented by digits, English
7 letters, and signs.

8 [0034] The extended display identification data, the bar code and the bar code data are stored in
9 the memory 60 through a display data channel (DDC) transmission manner when the display
10 apparatus is manufactured, and the extended display identification data is provided to a computer
11 when power is initially on. Thus, in order to transmit data through the display data channel
12 transmission manner, the controller 50 is connected to the I/O connector 53 by an SDA line for
13 transmitting data and an SCL line for generating a clock signal for transmitting data.

14 [0035] SDA and SCL in Fig. 2 mean Serial DAta (DDC data) and Serial CLock (DDC clock),
15 respectively, and indicate pins of an I/O connector. More specifically, they indicate the 12th and the
16 15th pins of a D-sub connector, respectively.

17 [0036] The used fact data such as the accumulated used time of the display apparatus and the
18 power on/off time thereof is counted by the controller 50, and stored in the memory 60.

1 [0037] The service engineer generally has a bar-code reader and a terminal including data on the
2 display apparatus. The service engineer outputs data on the display apparatus requiring a service on
3 the terminal by using the bar code reader, and provides a data to a central computer system of an
4 after-sale service center through an on-line or an off-line. Then, the central computer system makes
5 the data on the display apparatus into database, on the basis of the bar code and the after-sale
6 indicating line 25.

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7 [0038] As shown in Fig. 1, the bar code data, the used fact data, and the after-sale service data,
8 which are stored in the memory 60, are confirmed through the bar code 21 shown on a bar code
9 screen 20 on the panel 3 displayed according to selection of the bar code show key 13. On the bar
10 code screen 20, as shown through the on screen display, are shown the bar code 21 including the
11 interpretation line 22 represented by digits, English letters, and signs, and the after-sale service
12 indicating line 25 represented by a bar codes, English letters, digits, and signs.

13 [0039] If the bar code 21 and the after-sale service indicating line 25 are displayed on the bar code
14 screen 20 of the display apparatus, the service engineer reads the bar code 21 by using the bar-code
15 reader, and then the portable terminal of the service engineer shows the bar code data and the used
16 fact data indicated by the bar code 21. Further, if the service engineer inputs the after-sale service
17 indicating line 25 to the terminal, the terminal is immediately connected to the central computer
18 system of the after-sale service center, and then the service facts of the display apparatus from the

1 database of the central computer system are shown. At this time, instead of connecting the terminal
2 to the central computer system in real time, the after-sale service data may be firstly stored in the
3 terminal of the service engineer and then may be stored to the database of the central computer
4 system later.

5 [0040] Hereinbelow, a process of executing the bar code screen 20 on the panel 3 will be
6 described. Firstly, according as the after-sale service engineer selects the bar code show key 13, an
7 executing signal is transmitted to the controller 50. Then, the controller 50 controls the on screen
8 display part 61 to show the on screen display, and then the bar code 21 and the after-sale service
9 indicating line 25 stored in the memory 60 are shown on the on screen display.

10 [0041] Thereafter, if the service engineer inputs the bar code 21 and the after-sale service
11 indicating line 25 shown on the bar code screen 20 to the terminal by using the bar-code reader, on
12 the terminal is shown data on the display apparatus such as the accessories data, the used fact data,
13 the after-sale service data, and other information. Then, the service engineer repairs the display
14 apparatus, and inputs the failure cause and the service facts to the central computer system through
15 on-line or off-line so as to make a database. On the other hand, where the display apparatus does
16 not operate because of a power supplying error, the bar code data, the used fact data, and the after-
17 sale service data, which are stored in the memory 60, can be known through the terminal.

1 [0042] Consequently, according to the present invention, a bar code is shown through an on screen
2 display, so that it need not adhere a separate bar code to a display apparatus, and there is no need of
3 apprehensions that the bar code is worn away or vanished. Further, according to the present
4 invention, the bar code includes all sorts of data on the display apparatus such as accessories data,
5 used fact data, service facts data, and other information, so that it is convenient and easy for a service
6 engineer to know information on the display apparatus by using a bar-code reader and a terminal.

7 [0043] On the other hand, in the case of a workshop using a plurality of display apparatuses, if an
8 on screen display of every display apparatus is executed, a specification and a state thereof are easily
9 confirmed, so that it is convenient to inventory the display apparatus.

10 [0044] In the above description, the bar code show key 13 is formed of an additional key, or a
11 combination of the keys of the existing control part 15 so as to show the bar code data, the used fact
12 data, and an after-sale service data. However, instead of the bar code show key 13, showing the data
13 may be selected by a new menu added to the existing on screen display, in the same way as in the
14 existing menu selection.

15 [0045] As described above, according to the present invention, a bar code is shown through an on
16 screen display, so that it need not adhere a separate bar code to a display apparatus, and there is no
17 need of apprehensions that the bar code is worn away or vanished.

1 [0046] Figure 1 shows a bar code 21 and an after-sale service indicating line 25 being displayed,
2 in accordance with the principles of the present invention. Information can be displayed in a variety
3 of different ways, in accordance with the principles of the present invention. For example, data in
4 the bar code 21 can include manufacturing data and other types of data, and data in the after-sale
5 service indicating line 25 can include after-sale service data and other types of data. Also, when the
6 bar code show key is pressed, a first bar code 21 and a second bar code (not shown) can be
7 displayed, with the first bar code 21 containing predetermined manufacturing information and the
8 second bar code containing after-sale service data. Thus, the second bar code would be able to be
9 modified by a service technician after service was performed, for example. The second bar code
10 could be in lieu of the after-sale service indicating line 25, for example. In addition, there could be
11 a third bar code (not shown) below the first and second bar codes, for example, with additional
12 information such as used fact data or other data. Also, in accordance with the principles of the
13 present invention, the above-described bar code data could be stored in a memory in a particular
14 electronic device, and could therefor eliminate a need to affix a bar code label onto that particular
15 electronic device. If the particular electronic device had a display screen mounted thereon, then the
16 bar code information could be displayed on that display screen. However, if the electronic device
17 did not have a display screen mounted thereon, then the electronic device could be placed in
18 communication with a display device, and then the bar code data of the particular electronic device
19 could be displayed on the display device.

1 [0047] While there have been illustrated and described what are considered to be preferred
2 embodiments of the present invention, it will be understood by those skilled in the art that various
3 changes and modifications may be made, and equivalents may be substituted for elements thereof
4 without departing from the true scope of the present invention. In addition, many modifications may
5 be made to adapt a particular situation to the teaching of the present invention without departing
6 from the central scope thereof. Therefore, it is intended that the present invention not be limited to
7 the particular embodiment disclosed as the best mode contemplated for carrying out the present
8 invention, but that the present invention includes all embodiments falling within the scope of the
9 appended claims.